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(72) Inventor; and

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CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

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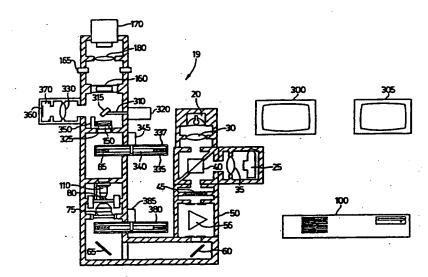
With international search report.

(88) Date of publication of the international search report: 18 February 1999 (18.02.99)

(54) Title: UV MICROSCOPE CONVERTING UV IMAGE TO VISIBLE COLOR IMAGE

#### (57) Abstract

color translating microscope research for and clinical applications involving imaging of living or dynamic samples in real time providing several novel techniques for image creation, sectioning, optical dynamic motion tracking and contrast enhancement comprises light source emitting UV light. and visible and IR light if This light is directed to the condenser via a means selecting monochromatic, bandpass, shortpass, longpass or notch limited light. condenser can be a brightfield, darkfield, phase contrast or DIC. The slide is mounted in a stage



capable of high speed movements in the X, Y and Z dimensions. The microscope uses broadband, narrowband or monochromat optimized objectives to direct the image of the sample to an image intensifier or UV sensitive video system. When an image intensifier is used it is either followed by a video camera, or in the simple version, by a synchronized set of filters which translate the image to a color image and deliver it to an eyepiece for viewing by the microscopist. Between the objective and the image intensifier there can be a selection of static or dynamic switchable filters. The video camera, if used, produces an image which is digitized by an image capture board in a computer. The image is then reassembled by an overlay process called color translation and the computer uses a combination of feedback from the information in the image and operator control to perform various tasks such as optical sectioning and three dimensional reconstruction, coordination of the monochromator while collecting multiple images sets called image planes, tracking dynamic sample elements in three space, control of the environment of the slide including electric, magnetic, acoustic, temperature, pressure and light levels, color filters and optics, control for microscope mode switching between transmitted, reflected, fluorescent, Raman, scanning, confocal, area limited, autofluorescent, acousto-optical and other modes.

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# IN. NATIONAL SEARCH REPORT

rational Application No PCT/CA 98/00350

			PC1/CA 96/00350
A. CLASS IPC 6	ification of subject matter G02B21/16 G01N21/64		
According t	o International Patent Classification (IPC) or to both national classific	ation and IPC	•
B. FIELDS	SEARCHED		
Minimum de IPC 6	ocumentation searched (classification system followed by classificati G02B G01N	ion symbols)	
Documenta	tion searched other than minimum documentation to the extent that a	such documents are inclu	ded in the fields searched
Electronic d	iata base consulted during the international search (name of data ba	se and, where practical,	search terms used)
C. DOCUM	ENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the rel	evant passagės	Relevant to claim No.
X	ZWORYKIN ET AL.: "Ultraviolet T Color-Translating Microscope" SCIENCE, vol. 126, no. 3278, 25 October 1 805-810, XP002075463		35,39,49
Υ	cited in the application see page 805 - page 807; figure	4	1,3,4, 7-10
Y	US 5 149 972 A (FAY FREDERIC ET 22 September 1992 see column 9, line 26 - line 50;	•	1,3,4, 7-10
X	US 5 481 401 A (KITA NOBUHIRO E 2 January 1996 cited in the application see column 16, line 28 - column 43; figure 9	·	16
X Furth	er documents are listed in the continuation of box C.	X Patent family m	embers are tisted in annex.
"A" documer consider of filing de "L" documer which is citation "O" documer other m"P" documer	nt defining the general state of the art which is not ared to be of particular relevance occurrent but published on or after the international ste at which may throw doubts on priority claim(s) or s cited to establish the publication date of another or other special reason (as specified) int referring to an oral disclosure, use, exhibition or reans at published prior to the international filing date but	or priority date and cited to understand invention "X" document of particul cannot be consider involve an inventive "V" document of particul cannot be consider document is combit	shed after the international filing date not in conflict with the application but the principle or theory underlying the ar relevance; the claimed invention ed novel or cannot be considered to e step when the document is taken alone ar relevance; the claimed invention ed to involve an inventive step when the ned with one or more other such documation being obvious to a person skilled of the same patent family
	ctual completion of the international search  August 1998	Date of mailing of the	e international search report
Name and m	ailing address of the ISA European Patent Office, P.B. 5818 Patentiaan 2 NL - 2280 HV Rigswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer	RS Face a sum of the second secon

#### TERMATIONAL SEARCH REPORT

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Category *	tion) DOCUMENTS CONSIDERED TO BE RELEVANT  Citation of document, with indication, where appropriate, of the relevant passages	Releva	ant to claim No.
A	US 5 233 197 A (BOWMAN DOUGLAS ET AL) 3 August 1993 see column 3, line 59 - column 7, line 17; figure 2		1,4,7, 16,39
1	PATENT ABSTRACTS OF JAPAN vol. 011, no. 015 (P-536), 16 January 1987 & JP 61 189515 A (CANON INC), 23 August 1986 see abstract	·	1
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Form PCT/ISA/210 (continuation of second sheet) (July 1992)



ational application No. PCT/CA 98/00350

Box I	Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)
This Inte	rmational Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
1.	Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
2.	Claims Nos.: because they relate to parts of the international Application that do not comply with the prescribed requirements to such an extent that no meaningful international Search can be carried out, specifically:
з.	Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
Box (i	Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)
This Int	ernational Searching Authority found multiple inventions in this international application, as follows:
	see additional sheet
1.	As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2	As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.	As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. 🗓	No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
	1-27, 35-49
Rema	rk on Protest The additional search fees were accompanied by the applicant's protest.
	No protest accompanied the payment of additional search fees.

# FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-27, 35-49

UV microscope converting observed light of different UV wavelength regions to different visible wavelengths therby converting the UV image to a visible coloured image.

2. Claims: 28-30

Active feedback control of the microscope illumination.

3. Claim: 31

Computer controlled selection of brightfield, or darkfield, or other observation modes.

4. Claim: 32

Computer controlled switching of objective lens.

5. Claim: 33

Computer controlled switching of the image intensifier

6. Claim: 34

Computer controlled switching of the video camera

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#### NTE" AT AL SEARCH REPORT

Inicipitation on patent family members

PCT/CA 98/00350

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US 5233197	Α	03-08-1993	NONE	